

Attachment to Preliminary Amendment dated July 25, 2001

1. (Amended) A process for separation and purification of a crude mixture comprising hydroquinone and resorcinol, optionally tars, and optionally catechol, in which process the crude mixture is first [of all] subjected to a series of distillation stages comprising:

- (i) [an optional distillation] optionally distilling in stage (I) [designed] to produce catechol as a distillation top product,
- (ii) obtaining the distillation bottom product [obtained under] from (i) or the crude mixture in the absence of stage (I) [is subjected] to a distillation stage (II) designed to produce, as distillation a top product, a resorcinol-rich fraction comprising resorcinol[, essentially,] and hydroquinone,
- (iii) subjecting the distillation bottom product obtained [under] from (ii) [is subjected] to a distillation stage (III) designed to produce, as a distillation top product, a hydroquinone-rich fraction comprising hydroquinone[, essentially,] and resorcinol,

and then subjecting the hydroquinone-rich fraction and/or the resorcinol-rich fraction [is/are subjected] to a refining stage (IV or V) in order to extract the hydroquinone and/or the resorcinol respectively.

2. (Amended) The process as claimed in claim 1, [characterized in that] wherein stage (I), when it is present, or stage (II) is preceded by at least one preliminary detarring stage (1, 1') designed to produce, as a bottom product, a tar-rich fraction and, as a top product, a detarred fraction which is used to feed stage (I) or stage (II).

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3. (Amended) The process as claimed in claim 2, [characterized in that] wherein two predistillation stages (1, 1') are provided, the tar-rich bottom fraction from the first (1) being used to feed the second (1') and the two detarred top fractions being used to feed stage (I) or (II).

4. (Amended) The process as claimed in [any one of claims 1 to 3] claim 1, [characterized in that] wherein stage (II) is designed to result in a resorcinol-rich fraction comprising:

- from 75 to 95%[, preferably from 85 to 92%, of] resorcinol, and
- from 5 to 25%[, preferably from 8 to 15%, of] hydroquinone.

5. (Amended) The process as claimed in [any one of claims 1 to 4] claim 1, [characterized in that] wherein stage (III) is designed to result in a hydroquinone-rich fraction comprising:

- from 75 to 98%[, preferably from 85 to 97.5%, of] hydroquinone, and
- from 2 to 25%[, preferably from 2.5 to 15%, of] resorcinol.

6. (Amended) The process as claimed in [any one of claims 1 to 5] claim 1, [characterized in that] wherein the refining of the rich fractions is carried out on drainers.

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7. (Amended) The process as claimed in [any one of claims 1 to 6] claim 1, [characterized in that] wherein the distillation column (I) has the following specifications:

- number of theoretical stages: from 5 to 40[, preferably from 10 to 30]; and
- reflux ratio R of between 1 and 10[, preferably between 2 and 5].

8. (Amended) The process as claimed in [any one of claims 1 to 6] claim 1, [characterized in that] wherein the distillation column (II) has the following specifications:

- number of theoretical stages: from 10 to 85[, preferably from 15 to 40]; and
- reflux ratio R of between 1 and 35[, preferably between 5 and 25].

9. (Amended) The process as claimed in [any one of claims 1 to 6] claim 1, [characterized in that] wherein the distillation column (III) is a scraped falling film device or a distillation column having the following specifications:

- number of theoretical stages: from 1 to 10[, preferably from 1 to 5], and
- reflux ratio R of between 0.5 and 5[, preferably between 1 and 2].

10. (Amended) The process as claimed in [any one of claims 1 to 6] claim 1, [characterized in that] wherein the detarring column or columns (1, 1') is/are scraped falling film devices.

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11. (Amended) The process as claimed in [any one of claims 1 to 10] claim 1, [characterized in that] wherein the crude mixture comprises, with respect to the total mixture:

- from 20 to 60%[, in particular from 30 to 50%,] by weight of hydroquinone,
- from 2 to 20%[, in particular from 2 to 15%,] by weight of resorcinol,
- from 0 to 20%[, in particular from 5 to 15%,] by weight of catechol, and
- the remainder being formed of various compounds[, essentially] comprising tars.

13. (Amended) The plant as claimed in claim 12, [characterized in that it] which additionally comprises:

- a detarring column (1) designed to produce, at the column top, a detarred fraction and, at the bottom of the column, a tar-rich fraction
 - optionally at least one other distillation column (11) fed with the tar-rich fraction originating from the preceding column (1) and designed to produce, at the column top, a detarred fraction and, at the bottom, a tar-rich fraction,
- the top fraction or fractions of these columns being used to feed column (I) or (II).

14. (Amended) The plant as claimed in claim 12 [or 13], [characterized in that] wherein the column (II) is designed to result in a resorcinol-rich fraction comprising:

- from 75 to 95%[, preferably from 85 to 92%, of] resorcinol, and
- from 5 to 25%[, preferably from 8 to 15%, of] hydroquinone.

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15. (Amended) The plant as claimed in [any one of claims 12 to 14] claim 12, [characterized in that] wherein the column (III) is designed to result in a hydroquinone-rich fraction comprising:

- from 75 to 98%[, preferably from 85 to 97.5%, of] hydroquinone, and
- from 2 to 25%[, preferably from 2.5 to 15%, of] resorcinol.

16. (Amended) The plant as claimed in [any one of claims 12 to 15] claim 12, [characterized in that] wherein the refining device or -devices are drainers.

17. (Amended) The plant as claimed in [any one of claims 12 to 16] claim 12, [characterized in that] wherein the distillation column (I) has the following specifications:

- number of theoretical stages: from 5 to 40[, preferably from 10 to 30]; and
- reflux ratio R of between 1 and 10[, preferably between 2 and 5].

18. (Amended) The plant as claimed in [any one of claims 12 to 17] claim 12, [characterized in that] wherein the distillation column (II) has the following specifications:

- number of theoretical stages: from 10 to 85[, preferably from 15 to 40; and
- reflux ratio R of between 1 and 35[, preferably between 5 and 25].

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19. (Amended) The plant as claimed in [any one of claims 12 to 18] claim 12, [characterized in that] wherein the distillation column (III) is a scraped falling film device or a distillation column having the following specifications:

- number of theoretical stages: from 1 to 10[, preferably from 1 to 5], and
- reflux ratio R of between 0.5 and 5[, preferably between 1 and 2].

20. (Amended) The plant as claimed in [any one of claims 12 to 19] claim 12, [characterized in that] wherein the detarring column or columns (1, 1') is/are scraped falling film devices.